Single-cell mass cytometry for analysis of immune system functional states.

Journal: Curr Opin Immunol

Publication Year: 2013

Authors: Zach B Bjornson, Garry P Nolan, Wendy J Fantl

PubMed link: 23999316

Funding Grants: Therapeutic Opportunities To Target Tumor Initiating Cells in Solid Tumors

Public Summary:
Mass cytometry facilitates high-dimensional, quantitative analysis of the effects of bioactive molecules on cell populations at single-cell resolution. Datasets are generated with panels of up to 45 antibodies. Each antibody is conjugated to a polymer chelated with a stable metal isotope, usually in the lanthanide series of the periodic table. Antibody panels recognize surface markers to delineate cell types simultaneously with intracellular signaling molecules to measure biological functions, such as metabolism, survival, DNA damage, cell cycle and apoptosis, to provide an overall determination of the network state of an individual cell. This review will cover the basics of mass cytometry as well as outline assays developed for the platform that enhance the immunologist's analytical arsenal.

Scientific Abstract:
Mass cytometry facilitates high-dimensional, quantitative analysis of the effects of bioactive molecules on cell populations at single-cell resolution. Datasets are generated with panels of up to 45 antibodies. Each antibody is conjugated to a polymer chelated with a stable metal isotope, usually in the lanthanide series of the periodic table. Antibody panels recognize surface markers to delineate cell types simultaneously with intracellular signaling molecules to measure biological functions, such as metabolism, survival, DNA damage, cell cycle and apoptosis, to provide an overall determination of the network state of an individual cell. This review will cover the basics of mass cytometry as well as outline assays developed for the platform that enhance the immunologist's analytical arsenal.